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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/831,028	Applicant(s) DA SILVA, NINO	
	Examiner Kevin Siangchin	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-11 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 04 May 2001 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *See Continuation Sheet*.

Continuation of Attachment(s) 6). Other: English Translation of DE4203447A1 .

Detailed Action

Amendments

1. The preliminary amendment filed May 4, 2001 has been entered into the record and claims 5, 7, 10 and 11 have been amended accordingly. The corrections to the Abstract have been acknowledged.

Drawings

Objections

2. The drawings are objected to because of the following. The labels and arrows are generally too light to be properly reproduced. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

Objections

3. The disclosure is objected to because of the following informalities. The disclosure is replete with instances of typographical and/or grammatical errors, several of which are listed below.

a. On page 6, line 9 of the Applicant's disclosure, the Applicant refers to claim 13. There is no claim 13 in the disclosure. The Applicant should refrain from referring, in the specification, to terms, etc. defined terms in the claims. The claimed subject matter should find support in the specification.

b. On page 6, line 16 of the Applicant's disclosure, the Applicant refers to claim 14. There is no claim 14 in the disclosure. The Applicant should refrain from referring, in the specification, to terms, etc. defined terms in the claims. The claimed subject matter should find support in the specification.

c. On page 6, line 20 of Applicant's disclosure, "teleradiologi" should be replaced with "teleradiology".

d. On page 6, line 31 of Applicant's disclosure, "considerably" should be replaced with "considerable".

e. On page 9, line 23 of Applicant's disclosure, "i.a." should be replaced with "i.e.".

f. On page 10, line 6 of Applicant's disclosure, the Applicant refers to "occurring films". The word "occurring " is improperly used here. "Observed films", "input films", or "films of interest" would, for example, be more appropriate.

g. On page 10, line 25 of Applicant's disclosure, "except of using" should be replaced with "except when using".

h. On page 11, line 1 of Applicant's disclosure, "blurr" should be replaced with "blur".

i. On page 11, line 22 of Applicant's disclosure, "practising out" should be replaced with "practicing".

j. Consider revising the sentence on page 11, lines 27-30 of the Applicant's disclosure. No new matter should be introduced.

k. Consider revising the sentence on page 12, lines 28-35 of the Applicant's disclosure. No new matter should be introduced.

l. On page 13, lines 11-12 of Applicant's disclosure, the applicant refers to "a simple image element". Nearly any aspect of an image can be considered a simple image element. The Applicant should be more specific. It seems from the specification that the Applicant intends this simple image element to be a (small) section of the image, such as a pixel. This should be indicated in the specification.

m. On page 13, lines 18-25 of the Applicant's disclosure, the Applicant states, "Step 1 implies that the exposure of the image is prevented ..." and, later, "Step 2 implies that the image transfer is stopped ...". As there is not previous definition of a step 1 and a step 2, they cannot be said to imply anything. To make this section of the disclosure make sense, it is suggested that the applicant instead state, "In the first step, the exposure of the image is prevented ... In the second step, the image transfer is stopped ...". Since these steps are disjoint, the Applicant could alternatively use similar language without any mention of steps (e.g. "The exposure of the image is prevented ...").

n. Consider revising the sentence on page 13, lines 26-31 of the Applicant's disclosure. No new matter should be introduced.

o. On page 13, line 35 of the Applicant's disclosure, the Applicant states, "average image of more picture fields". First, the term "picture fields" is undefined. This could be interpreted as entire images, portions of images, or individual pixels. Furthermore, taking the "average image of more picture fields" seems to indicate that an average is being taken of a set of picture fields in addition to an original set of picture fields. This, in turn, implies that there be some original set of picture fields, which is not consistent with the other portions of the disclosure. A more consistent statement could be (assuming that *picture fields* are properly defined), "average image of more than one picture fields", or "average image of multiple picture fields".

p. Consider revising the sentence on page 14, lines 6-12 of the Applicant's disclosure. No new matter should be introduced.

This list is not exhaustive. Portions of the disclosure, while marginally descriptive of the Applicant' claimed invention, are, nonetheless, difficult to read. The applicant should make some attempt to revise the poorly written portions of the disclosure, while not introducing any new matter. Appropriate correction is required.

Claims

Rejections Under 35 U.S.C. § 103(a)

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wittmer et al. (German Patent DE4,203,447A1 (Offenlegungsshrift)). in view of Echerer et al. (U.S. Patent 5,384,862). Note that reference will be made to the attached English translation of Wittmer et al.

6. *The following is in regard to Claim 1.* Wittmer et al. disclose a method for digitizing medical films (i.e. X-rays images used in diagnostics – Wittmer et al. page 1, lines 30-33) and archiving these digitized images (e.g. Wittmer et al. page 3, lines 30-35 to page 4, lines 1-15). The method is performed by using a digital camera (e.g. Wittmer et al., Fig. 1, reference number 5), attached to a positioning system (e.g. the rectangular structure supporting camera 15 in Wittmer et al. Fig. 1), and a screen (e.g. video screen 10 in Fig. 1 of Wittmer et al.), where the digital camera is connected to said screen and to a digital electronic image archive (e.g. image archive on base device 1 of Wittmer et al. Fig. 1. See also Wittmer et al. page 8, lines 15-27). This method comprises:

(1.a.) Medical films (e.g. X-rays 6 in Wittmer et al. Fig. 1) arranged on a light surface (e.g. light box 8 in Wittmer et al. Fig.1) are selectively examined on said screen (e.g. video screen 10 in Fig. 1 of Wittmer et al.) in order to find pathologically interesting parts. See Wittmer et al. Fig. 1.

(1.b.) Medical films with pathologically interesting parts found (e.g. X-rays 6 in Wittmer et al. Fig.) are selectively and partially magnified. See Wittmer et al. page 5, lines 20-26.

(1.d.) Digitized images thus obtained are transferred to and stored in said archive. This transfer can be to the image archive on base device 1 or to remote receiving station via the electronic data transfer (e.g. network) 13. See Fig. 1, page 8, lines 15-27, and page 9, lines 10-17 of Wittmer et al.

Wittmer et al., however, do not expressly show or suggest that: (1.c) the magnified films, or parts thereof, with pathologically interesting parts found (e.g. X-rays 6 in Wittmer et al. Fig.) being selectively exposed.

7. Echerer et al., on the other hand, disclose a method for evaluating radiographs, such as x-rays, wherein the radiograph under observation is scanned (digitized), either by a scanner or a digital camera suspended above the radiograph (see Echerer et al. Fig. 4 and column 5, lines 47-53), and enhanced in various ways (Echerer et al. Abstract). These enhancements include zooming-in (magnifying) a user-selected region of interest (ROI) and storing the resulting image. See Echerer et al. column 2 lines 54-65, column 5 lines 17-23, and column 7 lines 24-29, 36-47. That is, in the method of Echerer et al., a region of the digitized x-ray is selectively magnified (i.e. magnification of the ROI) and then selectively exposed.

8. Here, *selective exposure* is given the following interpretation. According to Echerer et al., regions of the image are magnified and stored. Since both Wittmer et al. and Echerer et al. use digital cameras, the image sensor or photodetector (e.g. CCD line sensor of Wittmer et al.) is exposed to light from the focused (or magnified) region of the image. This is analogous to the notion of exposure in film cameras and similar to the exposure of X-ray films. In this way, selective exposure can be interpreted as the exposure of the image sensor within the digital camera to regions that have been *selected* (ROIs), magnified and subsequently stored in accordance with the method of Echerer et al.

9. The teachings of Wittmer et al. and Echerer et al. are combinable because they are analogous art. In particular, both sets of teachings are directed to the digital capture, storage, and subsequent or simultaneous display of X-ray images. Furthermore, the disclosed systems share apparent similarities, in terms of structure and function (see, for example, Fig. 1 of Wittmer et al. and Fig. 4 of Echerer et al.). Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the applicant's claimed invention, to augment the functionality of Wittmer et al.'s method of image archival, to include the aforementioned selective magnification feature taught by Echerer et al. The motivation to do so would have been to provide the user(s) with a means to magnify and store pathologically

interesting features of the X-ray, thereby, facilitating diagnosis and eliminating extraneous image data from the archived image. The latter advantageously allows for the efficient utilization of storage and potentially increases communication bandwidth. Combining the teachings of Wittmer et al. and Echerer et al., in this manner, yields a method for digitizing and archiving X-ray images that is in accordance with the method set forth in claim 1.

10. *The following is in regard to Claim 2.* As shown above, the teachings of Wittmer et al. and Echerer et al. can be combined so as to satisfy the limitations of claim 1. Wittmer et al. discloses a method for the transfer of medical films, wherein the medical films (e.g. X-ray film(s) 6 in Wittmer et al. Fig. 1) are arranged in a light box (e.g. light box 8 in Wittmer et al. Fig. 1) and a digital camera (e.g. camera 5 in Wittmer et al. Fig. 1), attached to a positioning system (e.g. the rectangular structure supporting camera 15 in Wittmer et al. Fig. 1), is arranged in front of the light box. See Wittmer et al. Fig. 1. Clearly, this arrangement is fixed beforehand and, thus, precedes examination. Therefore, the method of film transfer, obtained by combining the teachings of Wittmer et al. and Echerer et al. in the manner discussed above, conforms to the method set forth in claim 2.

11. *The following is in regard to Claim 3.* As shown above, the teachings of Wittmer et al. and Echerer et al. can be combined so as to satisfy the limitations of claim 1. Clearly, the disclosed methodologies of Wittmer et al. and Echerer et al. are directed to toward medical diagnoses (via examination of X-rays). In this way, the method of film transfer, obtained by combining the teachings of Wittmer et al. and Echerer et al as discussed above, conforms to the method set forth in claim 3.

12. *The following is in regard to Claim 4.* As shown above, the teachings of Wittmer et al. and Echerer et al. can be combined so as to satisfy the limitations of claim 1. Wittmer et al. suggest the usage of their method to facilitate consultation in patient diagnosis. See, for example, Wittmer et al. page 9, lines 10-17.

13. X-ray rounds are a standard and oft-used practice in patient diagnosis. Therefore, it would have been obvious to a skilled practitioner in the radiological arts to employ the methodology of Wittmer et al., Echerer et al., or the aforementioned combination of their methodologies, in X-ray round diagnostics. A radiologist, for example, would be motivated to do so because such methodologies, or systems based thereon, provide persistent and optionally remote access to patient X-rays. In this way, the method of film transfer, obtained by combining the teachings of Wittmer et al. and Echerer et al as discussed above, conforms to the method set forth in claim 4.

14. *The following is in regard to Claim 5.* As shown above, the teachings of Wittmer et al. and Echerer et al. can be combined so as to satisfy the limitations of claim 1. Wittmer et al. further teaches that patient-related data is input and stored together with the digitized image in the electronic image archive. According to Wittmer et al., the patient-related data takes the form of text or appended sound of "spoken findings". See Wittmer et al. page 6, lines 1-10 and page 9, lines 6-17. In this way, the method of film transfer, obtained by combining the teachings of Wittmer et al. and Echerer et al as discussed above, conforms to the method set forth in claim 5.

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wittmer et al. in view of Echerer et al., in further view of Schrader et al. ("Critical Success Factors for a Hospital-Wide PACS", JAMAI 1997). Note that reference will be made to the attached English translation of Wittmer et al.

16. *The following is in regard to Claim 6.* As shown above, the teachings of Wittmer et al. and Echerer et al. can be combined so as to satisfy the limitations of claim 5. It was shown above that Wittmer et al.'s method for medical film transfer includes provisions for storing and interfacing with image and non-image patient data (which could loosely be considered analogous to an RIS). Moreover, it is clear that Wittmer et al.'s method is essentially a PACS systems, Wittmer et al. Despite this, Wittmer et al. do not expressly suggest that the digital electronic image archive is comprised of a PACS and the data storage is performed by communication with a patient-information system RIS, included in the PACS. Echerer et al. also do not show or suggest this.

17. Several digital electronic image archiving systems exist and are commercially available that include a PACS and RIS connected in the manner proposed in claim 6. Schrader et al., for example, disclose a digital electronic image archive comprised of a PACS and the data storage is performed by communication with a patient-information system RIS. See the Abstract of Schrader et al. and Fig. 1.

18. The teachings of Wittmer et al., Echerer et al. and Schrader et al. are combinable because they are analogous art – that is, Wittmer et al., Echerer et al. and Schrader et al. all disclose digitized medical image archival. In particular, Wittmer et al. show archiving medical images and patient-related data. See the discussion above with regard to claims 1 and 5. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the applicant's claimed invention, to configure the system, obtained by combining the teachings of Wittmer et al. and

Echerer et al., such that the digital image archive comprises a PACS and the data storage is performed by communication with a patient-information system RIS. One would have been motivated to configure the digital image archive in this manner because PACS/RIS systems are known to improve workflow in hospital settings. See the section entitled *SUPPORTING THE WORKFLOW* in Schrader et al. The method of medical film transfer, obtained by combining the teachings of Wittmer et al., Echerer et al., and Schrader et al. in this manner, conforms to the method set forth in claim 6.

19. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wittmer et al. in view of Echerer et al., in further view of Khutoryansky et al. (U.S. Patent 5,917,883). Note that reference will be made to the attached English translation of Wittmer et al.

20. *The following is in regard to Claim 7.* As shown above, the teachings of Wittmer et al. and Echerer et al. can be combined so as to satisfy the limitations of claim 1. However, neither Wittmer et al. nor Echerer et al. show or suggest that the presence of introduced motion un-sharpness before and during the selective exposure is measured.

21. Khutoryansky et al., on the other hand, disclose a radioscopic imaging system that utilizes a motion detection method to measure the amount of change in an image (i.e. image frames of a video sequence captured from an x-ray image of the subject by video camera 408 [Khutoryansky et al. Fig. 1] – see Khutoryansky et al. column 19 lines 53-67, column 32 lines 18-20, column 32 lines 59-61 and column 33 lines 1-11) intensity (brightness – e.g. Khutoryansky et al. column 33, lines 45-46) – i.e. motion artifacts or un-sharpness (e.g. Khutoryansky et al. column 7, lines 45-58) – induced by the motion of the imaging system or subject. See, for example, Khutoryansky et al. column 30, lines 27-35. In the motion detection method of Khutoryansky et al., the measure of the amount of change in an image (i.e. motion artifacts or un-sharpness) occurs before exposure (e.g. Khutoryansky et al. column 31, lines 30-42) and during exposure (e.g. Khutoryansky et al. column 24, lines 30-41). That is, Khutoryansky et al. teach measuring the presence of introduced motion artifacts (un-sharpness) before and during an exposure process.

22. The teachings of Wittmer et al., Echerer et al., and Khutoryansky et al. are combinable because they are analogous art. Specifically, the teachings of Wittmer et al., Echerer et al., and Khutoryansky et al. are all directed toward radiological imaging systems. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the applicant's claimed invention, to incorporate the aforementioned teachings of Khutoryansky et al., relating to their motion detection methodology, into the image digitization, transfer and archiving method, obtained by combining the teachings of Wittmer et al. and Echerer et al., as discussed above. Given the aforementioned selective exposure of the Wittmer et al. and Echerer et al. combination, it would have been clear and straightforward for one of ordinary skill in the art to simply apply Khutoryansky et al.'s motion detection during and before the *selective* exposure. The motivation to incorporate the teachings of Khutoryansky et al. into the method, obtained by combining the teachings of Wittmer et al. and Echerer et al., would have been to eliminate motion artifacts (e.g. Khutoryansky et al. column 7, lines 45-58) induced by either camera motion or motion of the subject. Combining these teachings in the manner just described yields a method that satisfies the limitations of claim 7.

23. *The following is in regard to Claim 8.* As shown above, the teachings of Wittmer et al., Echerer et al., and Khutoryansky et al. can be combined so as to satisfy the limitations of claim 7. Khutoryansky et al. detects motion (and, hence, the presence of motion artifacts) by measuring the variation in brightness over time. See, for example, Khutoryansky et al. column 33 lines 45-46, column 33 lines 51-62 and column 35 lines 48-53. Note that, while not explicitly stated, taking the difference of two pixel images (e.g. Khutoryansky et al. column 33, lines 51-58) generally requires that the difference be taken between each corresponding pixel (i.e. single image element) of the pixel images. Therefore, in the motion detection of Khutoryansky et al., the measure of motion (and, hence, motion artifacts) is dependant on the detection of temporal intensity variations in the pixels (i.e. simple image element) of the current image (with respect to the previous image). In this way, the method, obtained by combining the teachings of Wittmer et al., Echerer et al., and Khutoryansky et al. in the manner discussed above, conforms to the method proposed in claim 8.

24. *The following is in regard to Claim 9.* As shown above, the teachings of Wittmer et al., Echerer et al., and Khutoryansky et al. can be combined so as to satisfy the limitations of claim 7. Khutoryansky et al. suggests detecting motion (and, hence, the presence of motion artifacts) by measuring the rate at which the leading edge of a moving feature (i.e. a predetermined detail) advances on a pixel-by-pixel basis (Khutoryansky et al. column 27, lines

1-4). The rate at which the leading edge of a moving feature moves represents temporal image position variations for a predetermined detail on an X-ray. In this way, the method, obtained by combining the teachings of Wittmer et al., Echerer et al., and Khutoryansky et al. in the manner discussed above, conforms to the method proposed in claim 9.

25. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wittmer et al. in view of Echerer et al., in further view of DeForest et al. (U.S. Patent 4,908,876). Note that reference will be made to the attached English translation of Wittmer et al.

26. *The following is in regard to Claim 10.* As shown above, the teachings of Wittmer et al. and Echerer et al. can be combined so as to satisfy the limitations of claim 1. However, neither Wittmer et al. nor Echerer et al. show or suggest that the light intensity of the light surface is regulated in dependence on the dynamic range of a particular medical film.

27. DeForest et al. on the other hand, disclose an X-ray image viewing system, where the display of X-rays is enhanced through an adaptive modulation of the light emanating from a lightbox (DeForest et al. Abstract and Field of Invention). The adaptive modulation consists of selective intensity modulation of the viewing light generated by the lightbox in such a way that combination of the illumination pattern with the transparency image adjusts the large-scale contrast dynamic range of the viewed image (DeForest et al. column 2, line 68 to column 3, lines 1-7). Furthermore, it also apparent from DeForest et al. equation (5), that the pattern of the *unsharp* image (DeForest et al. column 7, lines 5-17) regulating the intensity modulation is dependant on the dynamic range of the observed X-ray image (or digitized versions thereof). Thus, DeForest et al. show a modulation or regulation of the intensity of light, emitted from the surface of a light box, being dependant on the dynamic range of a particular X-ray image.

28. The teachings of DeForest et al. are compatible with those of Wittmer et al. and Echerer et al. because they are all essentially directed to the viewing of an image. More particularly, both Wittmer et al. and Echerer et al. are concerned with the capture of an X-ray illuminated by a light box, while DeForest et al. deal with the enhancement of X-rays illuminated by a light box. Although the teachings of DeForest et al. are demonstrated for viewing by a human eye, it should be apparent, particularly given the presence and function of the imager 21 (DeForest et al. Fig. 1) in DeForest et al.'s apparatus, that these teachings are applicable to imaging systems, where the observation is

done via a camera, or the like. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the applicant's claimed invention, to incorporate the adaptively modulated illumination of DeForest et al. into the light box used in the method obtained by combining the teachings of Wittmer et al. and Echerer et al., in the manner discussed above. The motivation to modify the combination of Wittmer et al. and Echerer et al., in this manner, would have been to enhance the visibility of low-contrast features of the image, thereby permitting the observer (which is presumably a camera, or the like) to read the X-ray more accurately than with conventional uniform lighting (DeForest et al. column 3, lines 7-11). Combining the teachings of Wittmer et al., Echerer et al., and DeForest et al., in this manner, yields a method that conforms to the method proposed in claim 10.

29. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wittmer et al. in view of Echerer et al., in further view of Hess et al. (U.S. Patent 4,829,382). Note that reference will be made to the attached English translation of Wittmer et al.

30. *The following is in regard to Claim 11.* As shown above, the teachings of Wittmer et al. and Echerer et al. can be combined so as to satisfy the limitations of claim 1. However, neither Wittmer et al. nor Echerer et al. show or suggest that a diaphragm be arranged in front of the camera dependant on the dynamic range of a particular medical film.

31. Hess et al. disclose a method and apparatus for automatically controlling a diaphragm (Hess et al. Fig. 1, reference number 1) aperture attached to a video camera, in response to the amplitude and dynamic range of individual frames (e.g. frame depicted in Fig. 1a of Hess et al.) of the captured, digitized video sequence. See Hess et al. column 1 lines 9-10, column 2 lines 16-21, column 3 lines 58-61, and column 3 lines 65-68 to column 4 lines 1-2. In this way, Hess et al. show a diaphragm, arranged in front of the camera, whose operation is dependant on the dynamic range of a captured image.

32. The teachings of Hess et al. are compatible with those of Wittmer et al. and Echerer et al. because, the latter two employ cameras that capture frames of image data, while Hess et al. demonstrate the usage of a diaphragm attached to a camera analogous in form and function to those of Wittmer et al. and Echerer et al. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the applicant's claimed invention, to integrate the

automatic exposure control of Hess et al. into the camera used in the method, obtained by combining the teachings of Wittmer et al. and Echerer et al. The motivation to do so would have been to provide an optimal exposure for the dynamic range of a captured image. This, in turn, would improve overall contrast by reducing instances of over/underexposure. See Hess et al. column 1, lines 5-17 and column 2, lines 6-10. In this way, the teachings of Wittmer et al., Echerer et al., and Hess et al., when combined in the manner just described, address the limitations of claim 11.

Citation of Relevant Prior Art

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

[1] *U.S. Patent 5,537,226.* Wolberg et al.

Wolberg et al. disclose a method for correcting digital images captured by a scanning sensor in the presence of mechanical vibration. While Wolberg et al. do not directly demonstrate the detection of motion blur, they do provide an adequate theoretical basis and motivation for such detection. Wolberg et al. is relevant particularly to claims 7-9.

[2] *U.S. Patent 6,075,905.* Herman et al.

Herman et al. disclose a method for constructing an image mosaic. In this method motion blur occurring in a video sequence is detected. See column 7, lines 19-30. Motion blur is shown to be proportional to the product of the inter-frame displacement and exposure time. These teachings are relevant to claim 9, in particular.

[3] *U.S. Patents 5,189,513 and 5,386,264.* Sekine et al.

Sekine et al. disclose a method for the detection and correction of motion blur in an image, induced by vibration of the capture device, by computing the motion vector field between two frames. These teachings are relevant to claims 7-9.

[4] *U.S. Patent 5,053,875.* Ishii et al.

Ishii et al. detect motion blur in an image captured an image pickup means by determining the motion vector field for a pair of image. Ishii et al. show that the detection of blur is dependant on temporal spatial changes of image elements (Ishii et al. Fig. 5a). Based on the magnitude of the motion vector (and other factors), Ishii et al. adjust the exposure time accordingly. Thus, detection of blur occurs before and during exposure. See, for example, Fig. 5b.

[5] *U.S. Patent 5,450,126.* Nishida et al.

Nishida et al. disclose a method for the detection and correction of motion blur induced by the movement of an imaging device. The magnitude of the motion vector between video frames is indicative of the amount of image blur. A block correlative scheme is used to detect the correspondence between frames.

[6] *U.S. Patent 6,272,235.* Bacus et al.

Bacus et al. disclose a "virtual microscope". Images of biological specimens can be digitized, selectively magnified and stored. The digital images can be transmitted to a plurality of locations. Other data is appended to records associated with these digital images. This operation is similar to PACS/RIS and the Applicant's claimed invention.

[7] *U.S. Patent 4,833,625.* Fisher et al.

Fisher et al. disclose a PACS system with a selective magnification feature.

[8] *Visual Motion Estimation Based on Motion Blur Interpretation. M. Sc. Thesis.* Rekleitis. 1995.

Rekleitis gives a theoretical definition of motion blur. Rekleitis classifies prior methods of motion blur detection as being either Optical Flow type methods or Feature Based methods. Rekleitis proposes another method that derives image motion parameters from the motion blur itself by observing the characteristics of its frequency domain representation. Rekleitis' teachings are relevant to claims 8-9.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Siangchin whose telephone number is (703)305-7569. The examiner can normally be reached on 9:00am - 5:30pm, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703)308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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